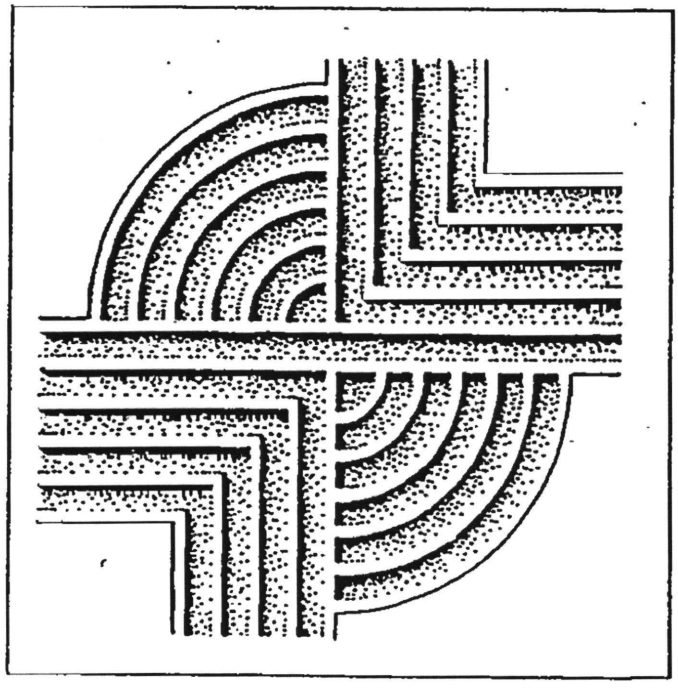
# ETHNOBOTANICAL ANALYSIS OF SAMPLES FROM THE BEEF MARKET, CHARLESTON, SOUTH CAROLINA



## RESEARCH CONTRIBUTION 3

# ETHNOBOTANICAL ANALYSIS OF SAMPLES FROM THE BEEF MARKET

# CHARLESTON, SOUTH CAROLINA

Michael Trinkley

Chicora Research Contribution 3

Chicora Foundation, Inc.
P.O. Box 8664
Columbia, South Carolina

October 1984

## Introduction

During the spring of 1984 archaeologists from The Charleston Museum, the University of Georgia at Athens, and the Chicora Foundation excavated at the site of Charleston's eighteenth century Beef Market. This work was funded by a Faculty Development Grant from the University of Georgia to Dr. Elizabeth Reitz and was assisted in support by The Charleston Museum. Fieldwork was under the direction of Ms. Martha Zierden, Research Archaeologist, The Charleston Museum.

The market was established about 1730 and was known as the New Market until the 1750s when the name was changed to the Beef Market. The building burned in 1796, but the area apparently continued to be used as a market for several years until the existing Charleston market was built. In 1800 the Charleston City Hall was erected on a portion of the site. The primary purpose of this work was to document the location of Charleston's eighteenth century market and to obtain information on the faunal species handled by the market. During the course of this work ethnobotanical material was collected from waterscreening and eventually from the flotation of selected samples. While the market apparently emphasized the sale of meat cuts and a number of leatherworking craftsmen located nearby, there is evidence that other items were handled at the market (Jeanne Calhoun, personal communication). Further, the 1796 fire occurred during the summer, enhancing the potential that produce might have burned and been preserved in the archaeological record. Consequently, an ethnobotanical study might reveal evidence of other activities at the market,

specifically the sale of plant foods and herbs.

Excavation at the site, which is today a small park east of City Hall, was limited to a single 5 by 10 foot unit adjacent to the City Hall on Broad Street. This unit was excavated in nine natural zones, with occasional subdivisions by arbitrary levels. The excavations revealed deposits ranging in age from about 1720 (zone 9, level 2) to 1830 (zone 2). Laying below zone 3 was a stratum (termed Feature 3) which dated to the construction of the City Hall in 1800, based on the abundance of marble chips and dust. Consequently, zones 4-9 relate to the operation of the New or Beef Market. No evidence of the 1796 fire was found in the excavations, providing additional support to the documentary evidence that the site was leveled and continued to be used as a market for several years.

Charcoal was hand picked from both the excavations and the 1/4-inch waterscreen. A series of 24 such samples were submitted for analysis. In addition, a series of 12 soil samples, ranging in size from 4 to 12 gallons in size, were collected for flotation. These samples were water floated by the Museum staff subsequent to the fieldwork. Flotation samples were submitted from zones 2-6, 8, 9, and Features 4-6.

All of the submitted hand picked samples were examined, but many of the flotation samples were quite small and contained a large proportion of trash (uncarbonized organic material such as rootlets). Consquently, only five of the 12 flotation samples are analyzed in this report. A sample of both market and post-market zones was selected from the better flotation collections. Zone 9, level 1 dates from the 1720s and should represent the early market period. The zone 6 sample dates from the 1740s. Zone 3 dates from the 1830s, after the site was abandoned by the market, City Hall was built, and the site was no longer actively occuppied. The flotation sample from Feature 5 dates

to the 1750s and the feature appears to represent a hard packed floor of the market. Feature 4, which dates from the late eighteenth century, represents fill from probable wagon ruts within the market.

## Procedures and Results

The five floated samples were prepared in a manner similar to that described by Yarnell (1974:113-114) and were examined under low magnification (7 to 30x) to identify carbonized plant foods and food remains. Remains were identified on the basis of gross morphological features and seed identification relied on U.S.D.A. (1948, 1971), Martin and Barkley (1961), and Montgomery (1977). Three of these flotation samples, zones 3, 9, and Feature 5, were 8 gallons in size, while the zone 6 sample was 12 gallons and the Feature 4 sample only 4 gallons. The results of this analysis are shown in Table 1.

Wood charcoal is the dominant component of each sample, with the incidence ranging from 82.2 to 99.0% by weight. The only food represented is a single fragmented kernal of corn (Zea mays) found in the Feature 5 float sample, collected from the hand packed floor within the posited market building. No measurements could be obtained from the kernal, which represents 0.1% of the Feature 5 sample. Seeds were represented by three specimens, one each from zones 3, 6, and Feature 5. All of the seeds were fragmented and none could be identified. Plant parts, consisting of a stem fragment and a leaf fragment, were recovered from the zone 9, level 1 and Feature 5 samples, respectively.

The handpicked samples were also examined under low magnification (7 to 30x) with the wood charcoal identified, where possible, to the genus level, using comparative samples, Panshin and de Zeeuw (1970), and Koehler (1917). Wood charcoal samples were broken in half to expose a fresh transverse

| | Wood Charcoal | | Bone | | Coal | | Plant Parts | | Debris | | Corn | | Seeds | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | wt | % | wt | % | wt | % | wt | % | wt | % | wt | % | wt | % | wt | % | Seeds |
| Zone 3 | 9.86 | 82.2 | 0.07 | 0.6 | | | | | 2.05 | 17.1 | | | 0.01 | 0.1 | 11.99 | 100 | 1 UID |
| Zone 6 | 54.58 | 99.0 | | | | | | | 0.52 | 0.9 | | | 0.01 | 0.1 | 55.11 | 100 | 1 UID |
| Zone 9/1 | 8.05 | 88.0 | | | | | t | - | 1.10 | 12.0 | | | | | 9.15 | 100 | |
| Feature 4 | 3.53 | 95.1 | | | | | | | 0.18 | 4.9 | | | | | 3.71 | 100 | |
| Feature 5 | 21.28 | 97.5 | | | 0.06 | 0.3 | t | - | 0.35 | 1.6 | 0.12 | 0.6 | t | - | 21.82 | 100 | 1 UID |

t = less than 0.1 g

Table 1. Flotation sample components from Test Pit 1, weight in grams.

surface. The results of this analysis are shown in Table 2, which is organized by provenience.

The charcoal from the Beef Market proveniences contain seven woods identified to the genus level and one category listed simply as diffuse porous. The post-Beef Market zones and features contain only four wood types and the diffuse porous wood. Both contain unidentified woods. In general terms, the post-Beef Market proveniences contain very small quantities of charcoal.

Pine (Pinus sp.) is found in nine of the 13 Beef Market proveniences (69.2%), but is dominant in only four (30.8%). While pine is found in three of the seven post-Beek Market proveniences (42.9%), it is dominant in none. Other woods found in the Beef Market zones include (in order of frequency) hickory (Carya sp.), oak (Quercus sp.), maple (Acer sp.), elm (Ulmus sp.), and cedar (Juniperus virginiana.) Both hickory and oak are quite common, occurring in 61.5% and 69.2% of the samples, respectively. A small quantity of acorn nutshell (Quercus sp.) is found in the zone 9 sample. Woods, other than pine, from the post-Beef Market proveniences include only oak and cedar.

Coal is found in 10 of the 13 Beef Market proveniences (76.9%), but is dominant in only five (38.5%). Within the zones 4-9 samples coal is found in all but zone 9, level 2. It is dominant, however, in only the upper two zones (15.4%). On the other hand, coal is ubiquitous in the post-Beef Market samples and is dominant in four of the six (66.7%), including zones 3 and 2 (level 1).

## Discussion

The ethnobotanical samples from the Beef Market reveal only limited information. Only a single food item, corn, was found in the flotation samples

| | *Pinus* sp. | *Juniperus virginiana* | *Quercus* sp. | *Quercus* sp. shell | *Carya* sp. | *Acer* sp. | *Ulmus* sp. | diffuse porous | UID wood | coal | slag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Zone 2, lv. | t | t | | | | | | | | + | |
| Zone 2, lv. 2 | | | | | | | | t | t | t | |
| Zone 3 | | | t | | | | | | | + | |
| Zone 4 | t | | | | t | | | t | t | + | |
| Zone 5 | t | | p | | t | | | | t | + | t |
| Zone 6 | t | | + | | p | | | | p | t | t |
| Zone 7 | + | t | t | | p | t | | | t | t | |
| Zone 8 | + | | | | t | | | t | | p | |
| Zone 9, lv. 1 | + | | t | | p | | | | t | p | |
| Zone 9, lv. 2 | + | | | t | t | t | | | | | |
| Area A | | | t | | | | p | | | | |
| PH 1 | | | | | t | | | | | + | p |
| PH 2 | t | | p | | | | | | | t | |
| Feature 1 | | | | | | | | | | + | |
| Feature 3 | p | | | | | | | | | + | |
| Feature 4 | t | | t | | | t | | | | p | + |
| Feature 5 | | | t | | | t | | | t | + | t |
| Feature 6 | | | t | | | | | | t | + | |
| Feature 8 | t | | t | | t | | | | | | |

+ = abundant, p = present, t = trace

Table 2. Analysis of handpicked charcoal samples from Test Pit 1.

and only a few badly fragmented seeds were recovered. There are very few data to support the presence and/or sale of plant foods at the market. This absence stands in stark contrast to the abundance of artifacts and faunal remains found at the site. The absence of plant remains may be related to several factors, including the small and very select sample and the failure to find evidence of the 1796 fire. Only one square, representing a very small sample of the Beef Market, is currently available for analysis. More abundant floral remains may lie elsewhere. In addition, the single excavated unit suggests that at least a portion of the market was cleared of the 1796 fire rubble at some time prior to the 1800 City Hall construction. This clearing operation may have resulted in the removal of large quantities of ethnobotanical remains, although it is unlikely that the entire site was so carefully cleaned.

This study, however, does provide several lines of potential research at the Beef Market site. The single food item found was from Feature 5, a Beef Market floor. If ethnobotanical remains are to be found, it is probable they will come from this feature or immediately above it. A second area of high botanical potential is zone 6, which is a dark, ashy midden segregated during the excavations. Feature 5 and zone 6 produced two of the three seeds recovered in the flotation samples. The present work, then, suggests that certain zones are more likely to contain significant botanical deposits than others. Future work should concentrate on obtaining samples from these identified proveniences.

Another line of significant research is the mixture of pine and hardwoods at the Beef Market site. Pine is the most abundant wood, but it is not so dominant as at First Trident (Trinkley 1983a), Campfield (Trinkley 1983b), Lodge Alley (Trinkley 1983c) or Archdale (Trinkley 1984). In fact, for the first time at a City of Charleston site, hardwoods are a strong component of

the identified collection. While pine was certainly a common wood, readily available in the Charleston area (see Croker 1979:37-38), it burns very quickly and is quite smoky (Reynolds 1942:6; U.S.D.A. 1978). Oak, hickory, and maple, which burn more slowly, provide more heat, and give off less smoke, would have been preferable as fuel. Previous efforts at ascribing status to various woods have met with limited success (see Trinkley 1984), so the Beef Market site may be useful in refocusing the study of fuel woods from status to function. Future work at the Beef Market should attempt to determine if hardwoods continue to be as common and further, if their presence is related to specific activities documented from the market. It seems unlikely that the woods represent soley heating fuels, given the probability that the market was open sided. It is more likely they were used in some cooking activity related to the sale of beef.

Finally, the presence of coal and its ratio to wood charcoal is another topic worthy of future research. At the Beef Market, coal was found from the second earliest deposit and its presence is documented at least as early as the 1720s. Reynolds (1942) suggests that the use of coal in the early eighteenth century was sporadic and confined to the wealthy. It did not become the predominant fuel in the south until the late nineteenth century (Reynolds 1942:5). Coal, however, was being advertised in Charleston newspapers by the mid-nineteenth century (Jeanne Calhoun, personal communication) and it has been found in an area of lower class residents during the mid-eighteenth and early nineteenth centuries (Trinkley 1983c). Coal was apparently available to and used by a variety of Charlestonians from the eighteenth century onward.

The single square at the Beef Market also suggests that as coal became more common, pine and other woods became less common. The reason for

this inverse relationship is not clear from the available data, although it is tempting to speculate that both wood and coal were used for the same purpose (perhaps simply as a heating fuel or more likely in some more specialized function relating to the preparation or marketing of beef) and as coal became more available in the late eighteenth century, wood use declined.

While the present ethnobotanical data from Beef Market are ambiguous, they suggest that further research is warranted. The preliminary work has indicated zones of deposition which may be more productive in the search for plant foods and also that soil samples for flotation should be a minimum of 8 gallons in size. Specific lines of research, other than the presence of plant foods and food remains, have been suggested. To implement the wood/coal ratio study, quantitative samples of both should be obtained from a variety of units on the site. Hand picked samples should continue to be collected for the study of woods used in the market. Finally, there should be further documentary research conducted to determine the possible functions of both the woods and the coal.

Sources Cited

Croker, Thomas C., Jr.
1979 Longleaf Pine: The Longleaf Pine Story. Journal of Forest History 23:32-43.

Koehler, Arthur
1917 Guidebook for the Identification of Woods Used for Ties and Timbers. U.S.D.A., Forest Service, Washington, D.C.

Martin, Alexander C. and William D. Barkley
1961 Seed Identification Manual. University of California Press, Berkeley.

Montgomery, F. H.
1977 Seeds and Fruits of Plants of Eastern Canada and Northeastern United States. University of Toronto Press, Toronto.

Panshin, A. J. and Carl de Zeeuw
1970 Textbook of Wood Technology, vol. 1. McGraw-Hill, New York.

Reynolds, R. V.
1942 Fuel Wood Used in the United States 1630-1930. Circular 30, United States Department of Agriculture, Washington, D.C.

Trinkley, Michael
1983a Analysis of Ethnobotanical Remains, First Trident Site, City of Charleston. In An Archaeological Study of the First Trident Site, Charleston, South Carolina, edited by Martha A. Zierden, Jeanne A. Calhoun, and Elizabeth Pinckney, pp. 88-96. Archaeological Contributions 6, The Charleston Museum, Charleston, South Carolina.

1983b Ethnobotanical Analysis of Specimens from Greenfield Plantation, Georgetown County, S.C. In An Archaeological Assessment of the Greenfield Borrow Pit, Georgetown County, edited by Martha A. Zierden and Jeanne A. Calhoun, pp. 57-69. Archaeological Contributions 4, The Charleston Museum, Charleston, South Carolina.

1983c The Lodge Alley Ethnobotanical Samples: Evidence of Plant Use from Two Urban Sites, Charleston, South Carolina. In Archaeological Investigations at Lodge Alley, Charleston, South Carolina, edited by Martha A. Zierden, Jeanne A. Calhoun, and Elizabeth A. Paysinger, pp. 112-119. Archaeological Contributions 5, The Charleston Museum, Charleston, South Carolina.

1984 Analysis of Ethnobotanical Remains, Archdale Plantation, Dorchester County, South Carolina. Research Contribution 2, Chicora Foundation, Columbia, South Carolina.

United States Department of Agriculture
1948 Woody Plant Seed Manual. Miscellaneous Publication 654, Forest Service, Washington, D.C.

1971 Common Weeds of the United States. Dover Publications, New York.

1978 Firewood for your Fireplace. Leaflet 559, Forest Service, Washington, D.C.

Yarnell, Richard A.
1974 Plant Food and Cultivation of the Salts Cavers. In Archaeology of the Mammoth Cave Area, edited by P. J. Watson, pp. 113-122. Academic Press, New York.